Richmond Refinery LPS Bulletin – Reliability

Instrument Air Filter Plastic Housing Failure

I-ERM Control: 34140

Location:
Hydroprocessing ABU –
North ISOMAX – ISO 6
Recycle Compressor

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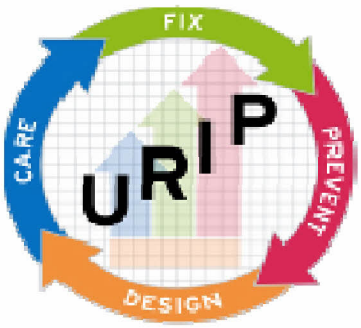
Reference:
Investigation # 20540

Detail view of leaking filter housing



URIP
Design/Care/Fix/Prevent

Incident Description:

During operator rounds of K-600 an operator identified what looked to be a steam leak from the turbine. The operator investigated and found that the leak was instrument air flowing from the housing of a plastic instrument air filter and pulling a nearby steam leak stream into the air jet. The air leak was found to be the control air for the speed controller of K-600 (ISOMAX Recycle Compressor). To prevent a unit shutdown, the turbine was situated into a posture to allow continued operation and the filter housing was replaced and relocated. Additionally, a spare filter was installed, thereby removing the filter as a single point of vulnerability.

Investigation Findings:

1) The plastic filter housing was placed near the compressor in an area of elevated heat.
2) A minor steam leak had occurred on the driver, which caused steam to be directed onto the filter housing thereby intensifying the heat that the unit was subjected to.

Lessons Learned / Business Practices:

1) Instrument air filter housings are not designed for elevated temperature situations should not be located directly beside the turbine driver.
2) Speed controller air supplies should have redundancy built into the design.

Recommendations:

1) Install redundant parallel filters and valving for control air on high criticality compressors.
2) Analyze the risk of steam leaks for possible effects to other equipment, even if the steam leak appears to be minor.
3) Review similar installations in the refinery that have filtration systems (e.g., equipment such as the highly critical steam turbines) and determine if such filtration systems should have parallel redundancy on the control air supplies."

Tenet of Operations Violated:

Tenet #5 - Always meet or exceed customer's requirements